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FACTOR 3

THE DIMENSIONALITY OF NATIONS PROJECT

RESEARCH REPORT

FACTOR 2

FACTOR 1

DEPARTMENT OF POLITICAL SCIENCE
UNIVERSITY OF HAWAII

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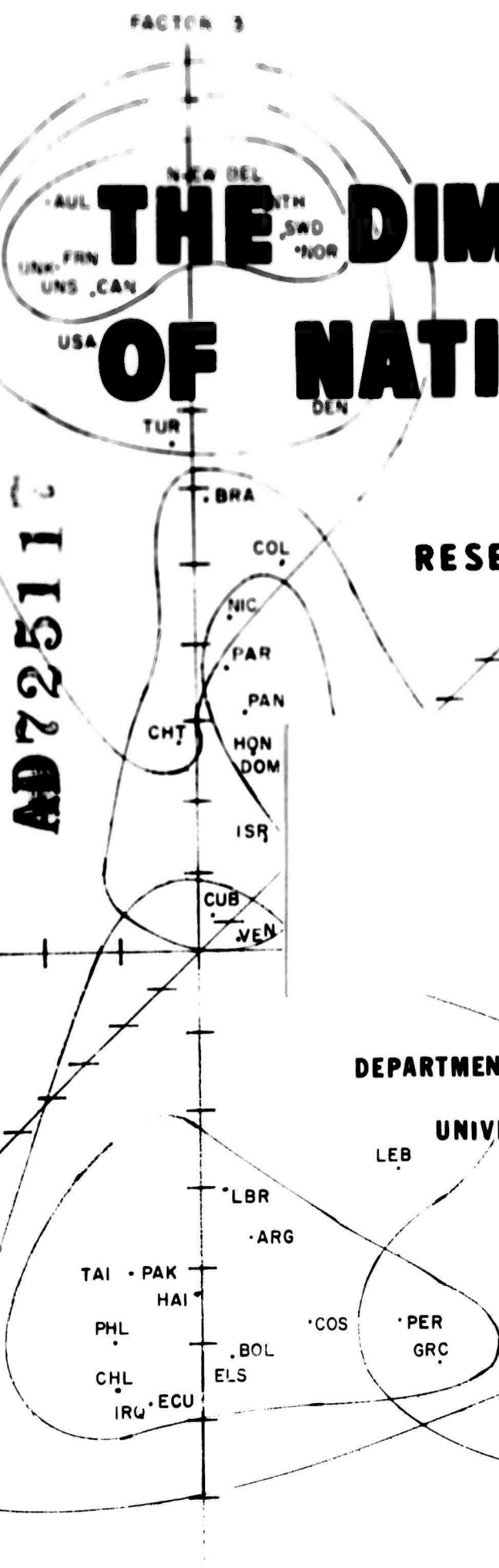


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Dimensionality of Nations Project

Quarterly Technical Report No. 2

June 1, 1968 - August 31, 1968

R. J. Rummel

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Abstract

Substantive and methodological analyses have continued during the quarter. An analysis of U.N. voting for 1963 delimited four major issue dimensions: sanctions against racial discrimination, U.N. procedures, Union of South Africa, and Cold War. A study of nation voting profiles on these issues showed that since 1955 there has been a considerable shift of nonaligned nations, such as Egypt, India, and Indonesia, away from the Soviet position.

A different analysis involved trying to forecast domestic conflict behavior from various functions of time, and concluded that simple time functions do not well forecast such conflict. Another analysis measured the dependence of national conflict behavior on psychological drives for affiliation, power, and achievement. Domestic and foreign conflict behavior were found largely independent of these motives.

Revisions of a mathematical model of foreign conflict behavior were tested on a global sample of dyads (pairs of nations) and for subsamples involving the same actor (e.g., US-USSR, US-UK, US-China, etc.). It was found that the effect of socio-economic, political, and geographic distances are contextual: no one function of these distances explains conflict well for all dyads. Rather, the effect of these distances varies by actor, and these distances particularly well predict the dyadic conflict behavior of Israel, China, USSR, UK, and the US.

On the methodological side, testing of a missing data estimation program was finished, programming of a canonical analysis program was begun, and the Project's major factor analysis program was revised to increase its speed. Moreover, variables, dyads, and nations for the 1950 data collection and analysis were selected during the quarter.

Data collection has been completed for all 1963 dyadic behavior and data screening and computation of descriptive statistics are underway. Collection of data on nation attributes and behavior for 1950 has begun.

Project expenditures were reduced by ten percent in anticipation of an ONR cutback. Straight line projection of expenditures conforms to the reduced budget total.

Quarterly Technical Report No. 2

INTRODUCTION

The second quarterly report conforms to the organization of the first. It is divided into six major sections. The first describes the analyses initiated and completed during the quarter, and results of special significance are highlighted. Methodological problems that have arisen during the analyses are discussed in the second section, and computer programs that have been written or revised during the quarter are also described. In this and previous sections, technical terms and discussion are avoided where possible.

The third section of the report describes the data collections begun and completed during the quarter and their disposition in data archives. Current personnel on the DON Project, personnel commitments made and consultation will be noted in the fourth section. Project publications, research reports, and monographs in preparation and completed during the quarter will be listed in the fifth section. The final sections delineates changes necessitated in the DON budget, status of subcontracts, and total versus expected expenditures to date.

1. ANALYSIS

1.1 1963 U.N. Voting Patterns and Groups. All roll calls cast in the 1963 General Assembly were analyzed for 99 nations to determine the patterns of voting -- the issue dimensions -- and how nations grouped in their votes.¹ Four major and three minor issue dimensions were formed. The major ones are: 1) sanctions against racial discrimination, 2) UN procedures, 3) Union of South Africa, and 4) Cold War. These four patterns embody about 69 percent of the variation in votes for the 99 nations.

The voting profile for each nation across the seven patterns was calculated and nations were grouped in terms of the congruence of their profiles. A very tight Soviet Union voting group was found, centrally involving Poland, Bulgaria, Hungary, and Czechoslovakia. Rumania was less central (meaning that she did occasionally vote different from the others) and Albania was peripheral. Yugoslavia's voting profile was quite independent of this group.

¹Within the overall project design the purpose of this analysis is to reduce the number of roll calls (69) to a few issues, which can then be included in a larger analysis with measures of cooperation, conflict behavior, diplomatic interaction, socio-economic distances, political distance, and geographic distance.

Other groups of distinct profiles were also found. One involved Netherlands, Italy, Canada, Turkey, New Zealand, Honduras, Greece, Japan, and peripherally, the U. S. The United States was obviously cross-pressured in her U.N. voting. A Scandinavian voting group was delineated, as well as one involving Sudan, Ethiopia, Egypt, Saudi Arabia, and Jordan. A large South American voting group was formed. Moreover, the Union of South Africa and the U.K. (on the periphery) formed a group; Portugal and Spain (on the periphery) formed another group.

These groups were compared with those found in a similar analyses of the 1955 UN session. Between 1955 and 1963 the Soviet voting bloc has changed. Previously,² India, Yemen, Saudi Arabia, Syria, and Yugoslavia were part of the Soviet voting bloc, with Egypt, Indonesia, and Uruguay on the periphery. This has changed in 1963, with all but the communist satellites moving to independent voting positions. However, the relationship of the U. S. voting profile to other nations has remained fairly the same. Thus, the shift in voting patterns from 1955 to 1963 has mainly been a shift away from the Soviet position for many non-aligned nations. A research report on these results is now being prepared.

1.2 Dynamics of Domestic Conflict. The magnitudes of domestic conflict for nine years on 74 nations during 1955-1966 were analyzed to determine whether such conflict could be forecast by some function of time. Various functions of time (e.g., linear, exponential) were tried without success. Results with simple periodic functions were poor. More complex periodic functions led to inconclusive results because of the small number (9) of years involved. The overall findings suggest that cross-national domestic conflict behavior cannot be forecast from simple time functions, while the utility of more complex functions remains undetermined. These results are now being written up by Dr. Joseph Firestone (see Section 6.2).

1.3 Motivations to Conflict Behavior. Content analysis data on drives for affiliation, power, and achievement within twenty-five nations were related to their domestic and foreign conflict behavior. Each one of these three drives was found to have little correlation with such behavior. Moreover, reanalysis showed that no linear combination of the three motive variables markedly improved the correlation. Thus, it appears that domestic and foreign conflict behavior are largely independent of psychological motives of affiliation, achievement, and power. A research report of these results also is being prepared by Dr. Joseph Firestone.

1.4 Conflict Model. Testing and revisions of a mathematical model of foreign conflict behavior was continued during the quarter. A multiplicative model involving time, as a measure of the likelihood of an event triggering conflict, and socio-economic, cultural, geographic, and political distances between nations was tested for 182 pairs of nations (dyads) and 1955 conflict behavior. Religious, economic, and power (capability) differences were found to significantly explain about 25 percent of the negative communications of dyads and 32 percent of their diplomatic conflict behavior patterns.

²The 1955 voting blocs are shown on the cover of this report.

When the 182 dyads are analyzed by subsample, the results were quite different. For 26 dyads in which Israel is the actor (e.g., Israel to US, Israel to USSR, Israel to China, Israel to Egypt), as much as 99 (ninety-nine!) percent of Israel's conflict behavior to 25 nations is explained by language differences, power parity, and political distance. For 25 dyads with China as an actor, economic, geographic, and political distance explain as much as 64 percent of her conflict behavior; for the USSR as actor, as much as 66 percent of her conflict behavior is explained by power parity, geographic distance, and political distance. Time, race, and language distance explain as much as 70 percent of UK's dyadic conflict behavior; by contrast, geographic, political, religious, and language distances and power parity explain about 64 percent of US dyadic conflict.

Thus, the effect of socio-economic, political, and geographic distances are contextual. No one function of these distances explains conflict well for all dyads. Rather, their effect varies by actor and they particularly well predict the dyadic conflict behavior of Israel, China, USSR, UK, and the U.S.

2. METHODOLOGY AND COMPUTER PROGRAMS

2.1 Change. As discussed in the first quarterly report, a major concern of the project is to measure change in the international system and nation behavior across time. During the previous quarter, a method--called deviational change measurement--was developed for measuring the shift in conflict behavior between two time periods. A problem develops, however, if it is desired to simultaneously interrelate the change for many variables and nations over many time points.

Out of a multivariate analysis workshop given by Dr. Ledyard Tucker, developed the idea of applying three-mode factor analysis to the problem. Preliminary work with the methodology suggests its feasibility and additional funds for more extensive work is being sought.

2.2 Missing Data Estimation. After continuing experimentation with the missing data estimation program reported in the last quarterly report (Section 2.4), some question about the convergence of the estimates and their standard error required several new test runs on randomly generated data. These tests have now been satisfactorily completed and a revised research report on the program is in preparation.

2.3 Canonical Analysis Program. Since we often find it necessary to do canonical analysis and existing canonical analysis computer programs are inadequate to our needs, the project undertook during the quarter to write such a program. Programming is now underway to produce a program that will give canonical correlations, weights for canonical variates, residuals for each canonical regression, trace canonical correlation (correlation of the two spaces), and a factor loading matrix of variables on canonical variates.

2.4 Variables and Samples for 1950. The variables, dyads, and nations for the 1950 data collection and analysis were selected during the quarter. A report and code manual giving these variables and samples have been prepared (see Section 5.4, Report No. 13).

2.5 Factor Analysis Program Revision. Due to a requirement for double precision arithmetic, the major factor analysis program of the project (MESA I) was found to be too slow on the new University of Hawaii 360/50 computer. Accordingly, the eigenvalue-eigenvector routine which used a Jacobian solution was removed from the program and a new sub-routine employing the Householder-Givens solution was programmed in its place. This decreased our computer time by as much as a factor of six, thus saving the project considerable computer cost.

3. DATA

3.1 Foreign Conflict Behavior Data. Due to the time involved, the principal investigator discontinued personally coding the daily NYT for conflict data as of July 1. Coding by assistants of selected years is continuing however. During the last quarter, coding of 1950 and 1960 conflict behavior was initiated and has continued through this quarter.

3.2 Dyadic Behavior Data. The computer screening (for error) and computation of descriptive statistics is virtually complete for about fifty variables on 1963 data. Data collection for 1950 dyadic behavior was initiated during the quarter.

3.3 Nation Attribute Data. All data for about 100 variables on 1963 nation attributes has been collected and error checking is virtually complete. Computation of descriptive statistics is underway. Also initiated during the quarter was data collection on similar attributes for 1950 data.

3.4 Treaties, International Organizations, and UN Voting Data. A matrix of data on treaties signed in 1950 by all nations was completed during the quarter and punched on cards. Also completed and punched was a matrix of international organization memberships for 1950. These data will be subsequently analyzed to determine the number of treaties and international organization per nation, and per nation pair (such as U.K. and U.S.A.). These frequencies will be used in the projected 1950 dyadic behavior analysis.

Data collection on all roll call votes in the 1950 UN was begun. When complete, these data will be analyzed to determine the 1950 voting patterns and compared with those for 1955 and 1963 (see Section 1.1).

4. PERSONNEL

4.1 Research Associates. Professor Michael Shapiro continued his programming of a foreign policy decision-making model of crisis behavior. Dr. Richard Chadwick from System Development Corporation joined the project during the summer. He has been involved in measuring the interaction patterns, particularly trade, between nations and relating these patterns to their conflict and characteristics.

Professor Steven Erams (from Syracuse University) joined the project for the summer, during which he developed equations explicating the limits of predictions from probability models. Professor Terry Nardin (State University of New York at Buffalo) also joined the project for the summer and worked on a conceptual framework for studying conflict control.

Dr. Nils Gleditsch (Peace Research Institute, Oslo, Norway) will join the project as a research associate from January to May, 1969. He will be concerned with a graph theory approach to interaction patterns between nations.

4.2 Research Assistants. Eight graduate research assistants and two half-time programmers continued with the project through the summer. One has completed his dissertation research on conflict resolution between nations and will be subsequently writing up the results. Another has completed his dissertation (not related to DON) and received his Ph.D. at the end of the quarter.

4.3 Graduate Research Affiliates. This refers to unpaid graduate students working on the project, as a means of becoming acquainted with multivariate research on international relations. Three graduate research affiliates worked on DON during the quarter.

4.4 Floating Graduate Student. This plan has been described in the first quarterly report (Section 4.3) and involves sending assistants to work on projects elsewhere for up to a year. Mr. Dennis Hall, a research assistant on DON, left during the quarter to work for the academic year with the Simulated International Processes Project at Northwestern University directed by Professor Harold Guetzkow.

4.5 Consultation. Professors Raymond Tanter (University of Michigan) and Jack Sawyer (Northwestern University) spent ten days with DON as consultants on the Dimensions of Nations book, the major publication to be forthcoming from DON, and the project research design and analysis. While here, both participated in project analyses and gave presentations to the staff.

Professor Ledyard Tucker (University of Illinois) gave a multivariate methods workshop at the University during the summer. The principal investigator and research assistants participated in the workshop.

5. PUBLICATIONS AND REPORTS (June 1 - August 31, 1968).

5.1 Publications

Rummel, R. J., "Progress in Understanding International Relations: The DOK Project," East West Center Review, 1968

5.2 Publications in Press

Rummel, R. J., Applied Factor Analysis.

_____, "Indicators of Cross-National and International Patterns," American Political Science Review.

_____, "International Pattern and Profile Delineation," The Computer and the Policy Making Community.

_____, "Dimensions of Foreign and Domestic Conflict Behavior: Review of Findings," in Dean Pruitt and Richard Snyder (eds.), Theories of International Conflict.

_____, "Some Empirical Findings on Nations and their Behavior," World Politics.

Hall, Dennis, "An IBM 360 Pattern Profile Program," Behavioral Science.

5.3 Books in Preparation. The final draft of Dimensions of Nations was completed during the quarter. This book presents the findings of DOK on the patterns and relationships in the characteristics and behavior of nations.

Dimensions of Conflict, a collection of DOK articles and research reports edited by Professor Willard Keim and the principal investigator, is in the process of revision. Several research reports now in preparation will also be added to the manuscript.

5.4 Research Reports.

Hall, Dennis R. and R. J. Rummel, "The Patterns of Dyadic Foreign Conflict Behavior for 1963," Research Report No. 12.

Rummel, R. J., "Attribute and Behavioral Spaces of Nations: Variables and Samples for 1950," Research Report No. 13.

6. BUDGET

6.1 Line Items. At the request of Acting President Hiatt of the University of Hawaii, effective July 1 all expenditures of the project were reduced ten percent pending final notification of budget cuts, if any, due to the six billion dollar federal budget reduction. Total expenditures during the quarter were within this reduced budget. A straight line projection of expenditures are also within the grand total (subtracting ten percent for the 1968-69 fiscal year).

6.2 Sub-contracts. Dr. Joseph Firestone, the principal investigator of the sub-contract with Cornell Aeronautical Laboratory (see Section 6.2, last quarterly report), spent the quarter with the project. The point of his research is to determine whether psychological motives can account for variation in nation behavior apart from structural conditions, as for example, economic development and size. Some of his results are given in Sections 1.2 and 1.3. He is now engaged in writing up his findings.

Preliminary discussions had taken place during the last year to grant a sub-contract to Professor J. David Singer of the University of Michigan to collect historical data on several crucial variables. These data would help enable testing the project's results for historical periods. Unfortunately, the plans for the sub-contract had to be dropped as a result of the ten percent cut-back in project expenditures.

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